

VIA FACSIMILE TRANSMISSION 571-273-8300

Docket No. 135271  
PATENTIN THE CLAIMS

1. (Currently Amended) A sub-aperture transceiver system to be housed in an ultrasound probe, the system comprising:

a probe housing;

a signal processor located in the probe housing;

receive signal connections coupling the signal processor to a receive sub-aperture comprising acoustic transceiver elements;

transmit signal connections coupled to a transmit sub-aperture comprising at least one acoustic transceiver element multiplexed with the receive sub-aperture, the signal processor performing beamforming on the receive sub-aperture to produce a receive sub-aperture signal;

a receive sub-aperture output driven by the signal processor for carrying a ~~signal obtained over the receive aperture~~, the receive sub-aperture signal ~~output being output from~~ the probe housing.

2. (Currently Amended) The system of claim 1, where the receive sub-aperture is a triangular sub-aperture.

3. (Currently Amended) The system of claim 1, where the transmit sub-aperture is square.

4. (Currently Amended) The system of claim 1, where the receive sub-aperture comprises at least two uneven rows of acoustic transceiver elements.

5. (Currently Amended) The system of claim 1, where the receive signal connections couple the signal processor to a plurality of receive sub-apertures.

VIA FACSIMILE TRANSMISSION 571-273-8300

Docket No. 135271  
PATENT

6. (Currently Amended) The system of claim 1, where the transmit signal connections couple the signal processor to a plurality of transmit sub-apertures.

7. (Currently Amended) The system of claim 6, where the receive sub-apertures are triangular receive sub-apertures.

8. (Currently Amended) The system of claim 1, ~~where the signal processor is one of~~ further comprising a plurality of signal processors coupled to a corresponding plurality of receive sub-apertures, each of the signal processors performing beamforming for the corresponding receive sub-aperture ~~distributed over a plurality of processing boards.~~

9. (Currently Amended) The system of claim 8, where the receive signal connections further couple each signal processor to ~~a plurality of the corresponding receive sub-apertures, the receive sub-apertures collectively forming a receive aperture.~~

10. (Currently Amended) A sub-aperture transceiver system comprising:

a first processing board;

a second processing board joined serially in a chained arrangement with the first processing board; and

receive signal connections for a plurality of receive sub-apertures distributed between the first and second processing boards, the first and second processing boards producing first and second receive data, respectively, the first processing board transferring the first receive data serially to the second processing board that outputs serially the first and second receive data;

where the receive signal connections couple each receive sub-aperture to at least one of the processing boards without partitioning any receive sub-aperture between the processing boards.

VIA FACSIMILE TRANSMISSION 571-273-8300

Docket No. 135271  
PATENT

11. (Currently Amended) The system of claim 10, further comprising:  
transmit signal connections for a plurality of transmit sub-apertures distributed between the first and second processing boards,

where the transmit signal connections couple each transmit sub-aperture to at least one of the processing boards without partitioning any transmit sub-aperture between the processing boards.

12. (Currently Amended) The system of claim 10, further comprising:  
transmit signal connections for a plurality of transmit sub-apertures distributed between the first and second processing boards,

where at least one transmit sub-aperture comprises a transducer element multiplexed between at least one receive sub-aperture.

13. (Original) The system of claim 10, further comprising a first cable bearing selected ones of the receive signal connections to the first processing board and a second cable bearing selected ones of the signal connections to the second processing board.

14. (Original) The system of claim 13, where the first and second cable are flex cables.

15. (Original) The system of claim 13, where the cable comprises selected ones of the receive signal connections for a first transducer array line.

16. (Original) The system of claim 10, further comprising a first signal processor on the first processing board and a second signal processor on the second processing board.

17. (Currently Amended) The system of claim 16, where the first signal processor is coupled to a first plurality of receive sub-apertures through the receive signal connections

VIA FACSIMILE TRANSMISSION 571-273-8300

Docket No. 135271  
PATENT

and where the second signal processor is coupled to a second plurality of receive sub-apertures through the receive signal connections.

18. (Currently Amended) The system of claim 10, where the receive sub-apertures are triangular receive sub-apertures.

19. (Currently Amended) The system of claim 12, where the transmit sub-apertures are square transmit sub-apertures.

20. (Original) The system of claim 10, where the first and second processing boards are disposed in an ultrasound probe.

21. (Currently Amended) A method in an ultrasound system for sub-aperture processing, the method comprising the steps of:

~~receiving~~ performing sub-aperture beamforming, at a signal processor located in an ultrasound probe, based on a plurality of receive signals received from acoustic transducer elements that ~~comprise~~ form a receive sub-aperture;

multiplexing, within the ultrasound probe, at least one of the acoustic transducer elements between the receive sub-aperture and a transmit sub-aperture; and

driving a receive sub-aperture output ~~coupled to~~ by the signal processor with a receive sub-aperture signal obtained over the acoustic transducer elements in the receive sub-aperture.

22. (Currently Amended) The method of claim 21, where the receive sub-aperture is a triangular sub-aperture.

23. (Currently Amended) The method of claim 21, where the transmit sub-aperture is square.

VIA FACSIMILE TRANSMISSION 571-273-8300

Docket No. 135271  
PATENT

24. (Currently Amended) ~~The method of claim 21, where the step of receiving comprises the step of:~~ A method in an ultrasound system for sub-aperture processing, the method comprising:

receiving, for a plurality of receive sub-apertures, receive signals distributed to a first signal processor on a first a first processing board and a second signal processor on a second processing board without partitioning any of the receive sub-apertures between the processing boards;

multiplexing, within the ultrasound probe, at least one of the acoustic transducer elements between the receive sub-aperture and a transmit sub-aperture; and

driving a receive sub-aperture output by the signal processor with a receive sub-aperture signal obtained over the acoustic transducer elements in the receive sub-aperture.

25. (Currently Amended) ~~The method of claim 21, further comprising the step of:~~ A method in an ultrasound system for sub-aperture processing, the method comprising:

receiving, at a signal processor located in an ultrasound probe, a plurality of receive signals from acoustic transducer elements that comprise a receive sub-aperture;

multiplexing, within the ultrasound probe, at least one of the acoustic transducer elements between the receive sub-aperture and a transmit sub-aperture;

driving a receive sub-aperture output coupled to the signal processor with a signal obtained over the acoustic transducer elements in the receive sub-aperture;

coupling transmit signals to a plurality of transmit apertures over transmit signal connections distributed between the first and second processing boards, and

VIA FACSIMILE TRANSMISSION 571-273-8300

Docket No. 135271  
PATENT

where the transmit signal connections couple each transmit sub-aperture to at least one of the processing boards without partitioning any of the transmit sub-apertures between the processing boards.